i.Terminal® mobile
Software application

Instructions for use together with an iPad®

Instructions for use together with an iPad®
i.Terminal® mobile
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3/31/2015

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Contents

Contents 3

Safety instructions 5

General 5

Symbols used 5

Safe functioning 6

Electrical safety 6

Prerequisites regarding operation 7

WLAN mode 7

Use of the iPad 7

Scope of supplies 8

Admissible spare parts 8

Directives, regulations and standards 9

Medical Devices Directive 9

Intended use 9

Provisions for use 9

Standards 10

Commissioning 10

Prerequisites 10

Installing the software application i.Com mobile on the iPad 10

Starting i.Terminal mobile 12

Operation 17

Use of the calibration tool 17

Positioning the customer for image capture 19

Image capture 20

Taking the front image 20

Taking side image 23

Measuring back vertex distance and mounting lens angle 24

Determining the centration data **26**
Determination of the centration point position 26
Selection of the lens type, the frame type and activation of the autocorrect feature (Auto Correction) 31
Specific settings for i.Terminal mobile **36**
Setting option Centration **37**
Setting option Features **39**
How to put the unit out of operation **40**
Exiting i.Terminal mobile **40**
Maintenance and service **41**
Performing software updates **41**
Service contact details **41**
General Licensing Agreement for i.Terminal mobile software **42**
Abbreviations **46**
Glossary **47**
Centration data summary **47**
Correction of head rotation (Auto Correction) **48**
Natural posture **50**
Vertical correction (auto-y) **51**
Calculation of centration data for bifocal and multifocal lenses (drop angle) **52**
Illustrations **53**
Index **55**

Safety instructions

General

The software application i.Terminal mobile has been developed and tested according to national and international standards. This ensures a high degree of functional reliability.
Observe all safety instructions and information contained in this User Manual and attached to accessories.

Symbols used

CAUTION

Points out dangers which may give rise to damage.

This information points out important information to facilitate your work.

Safe functioning

CAUTION

Correct operation of the software application i.Terminal mobile is indispensable to ensure safe operation. Thus, please familiarize yourself thoroughly with this operating manual before using the software.

Please also comply with the concise instructions and the online help of the iPad used and the Quick Guides for the i.Com mobile or the i.Terminal mobile. For supplementary information, please contact our service department or authorized dealers.

Always keep the User Manual/Quick Guide within easy reach for the operators.

For further information, please contact our Service Team.

Electrical safety

If the software application i.Terminal mobile is operated correctly, this system does not involve any electrical danger for customers or operators.

Prerequisites regarding operation

Please make sure that the following prerequisites are complied with and are retained for subsequent operation:

☞ The use of i.Terminal mobile requires a functioning WLAN connection via WLAN router and access to Internet.

Before starting operation

- Make sure that there is a stable WLAN connection with access to Internet.
- Make sure that the i.Com mobile Box is switched ON.

After operation

- Availability of the software application i.Terminal mobile is terminated automatically on switching the i.Com mobile Box OFF.

WLAN mode

Carl Zeiss Vision cannot assume any liability for the WLAN connection being operative.

Use of the iPad

Carl Zeiss Vision cannot assume any liability for the iPad being operative.

Scope of supplies

The scope of supplies includes:

- i.Com mobile Box incl. power unit and power cable
- Calibration tool in the storage case (2 ea.)
- User Manual i.Terminal mobile
- Quick Guide i.Terminal mobile (electronic)
- Quick Guide i.Com mobile (electronic)
- Label as fixation mark for the iPad camera
- Service Contact List (20_070_7217I)

Admissible spare parts

The following spare parts can be ordered for utilization of i.Terminal mobile:

- Calibration tool in the storage case
  (ref. no. for 1 ea.): 1941298)

☞ The calibration tool is used to determine the centration data and is a consumable material with a limited service life.

Directives, regulations and standards

Medical Devices Directive

This software application complies with the EU Directive 93/42/EEC regarding medical devices and national implementation thereof in terms of the German Medical Devices Act (MPG).

Please comply with the legal provisions for the prevention of accidents.

Risk class for software class A acc. to MPG: I

Intended use

i.Terminal mobile is a software application to determine the centration data of corrective lenses.

The application may only be used as specified in this User Manual.

Provisions for use

i.Terminal mobile is a software application which is intended for use on an Apple iPad under iOS in the ophthalmic optician's shop.

☞ The software application may only be used by persons who dispose of the training, knowledge and experience required to this effect. Moreover, please comply with the national quality directives valid in your country. The further processing of the centration data determined requires fundamental ophthalmologic knowledge.

Standards

i.Terminal mobile satisfies the requirements of the following standard:

– IEC 62304, Medical Device Software - Software life cycle processes

Commissioning

Prerequisites

– Active WLAN connection with access to Internet

– Completely installed, configured and switched-on i.Com mobile Box (see Quick Guide i.Com mobile)

– iPad with installed software application i.Com mobile (see Quick Guide i.Com mobile)

Installing the software application i.Com mobile on the iPad

☞ To install the software application i.Com mobile (e. g. on a second iPad), proceed as follows. To this effect, the i.Com mobile Box must be switched OFF.

- Switch the iPad ON and enter the URL www.zeiss.com/dti-mobile-solutions in the Safari Browser.

- Complete the registration form and download the app.

The software application i.Com mobile is installed. This takes a few minutes.

Subsequently, the three icons **i.Com mobile**, **i.Profiler mobile** and **i.Terminal 2** appear on the touchscreen of the iPad and can be used to start the application in question.

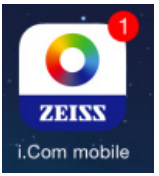
Fig. 1: **i.Com mobile**, **i.Profiler mobile** and **i.Terminal 2** icons on the iPad

- Once installation is complete, close the Safari Browser and switch the i.Com mobile Box ON again.

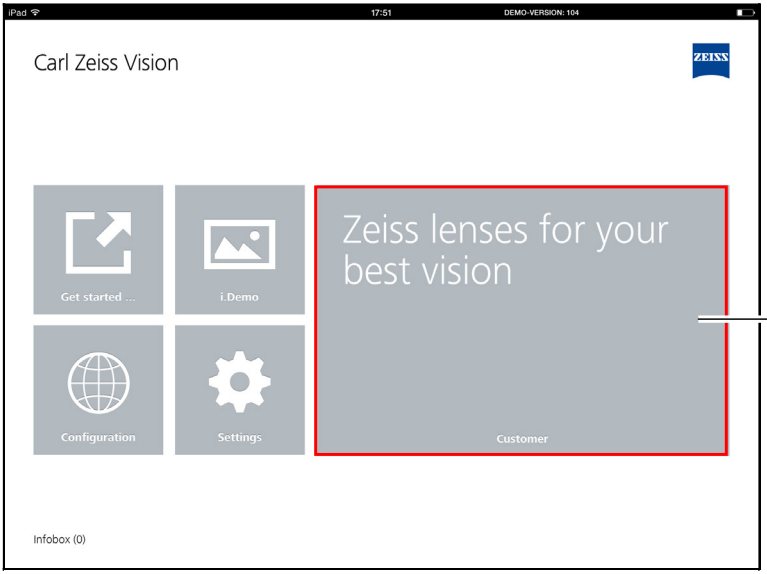
Starting i.Terminal mobile

- Touch the **i.Com mobile** icon on the iPad to start i.Com mobile.

The start screen appears with the main menu (see Fig. 2).



i.Com mobile icon



1 **Customer** tile

Fig. 2: i.Com mobile main menu

- Touch the **Customer** tile (**1**, Fig. 2) in the main menu.

The **Customer** menu appears (see Fig. 3).

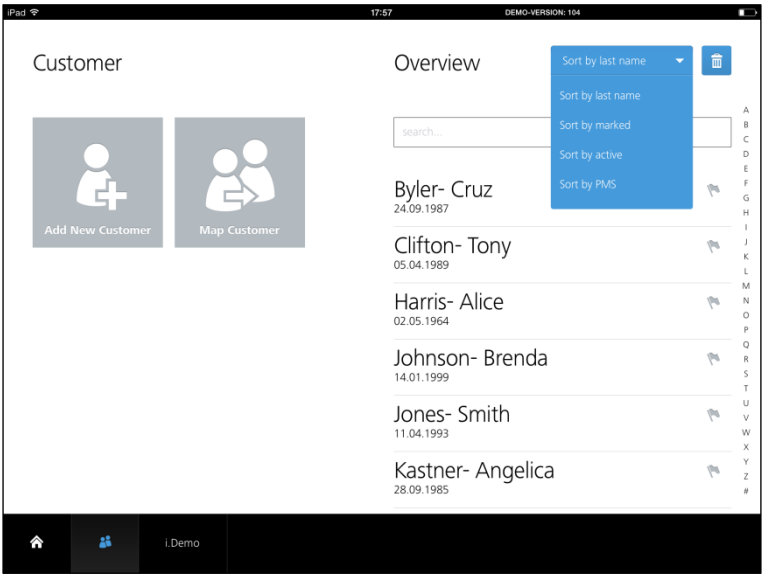
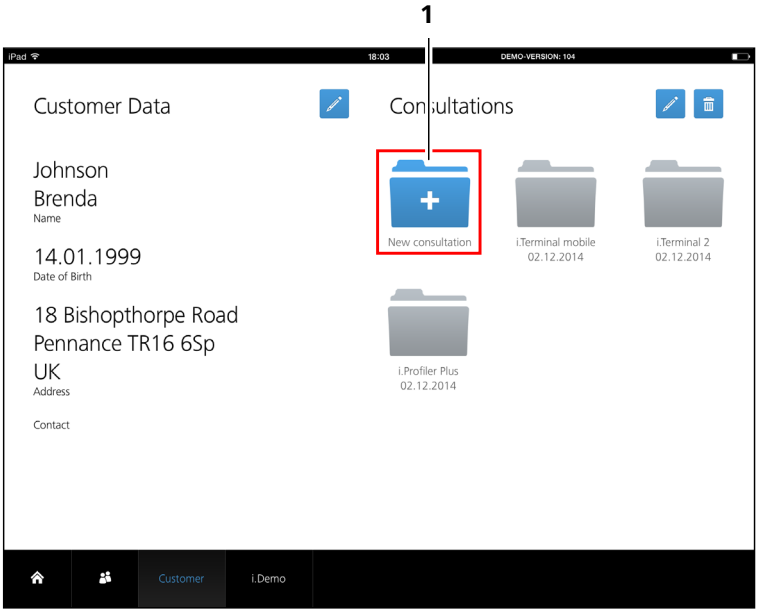


Fig. 3: **Customer** menu

- Select the customer for acquisition of the centration data by touching his/her name in the **Overview**.

The Customer module (customer data of active customer) appears (see Fig. 4).

☞ If the customer does not appear in the overview, you have to create a new customer data record or import the data from other sources (see Quick Guide i.Com mobile).

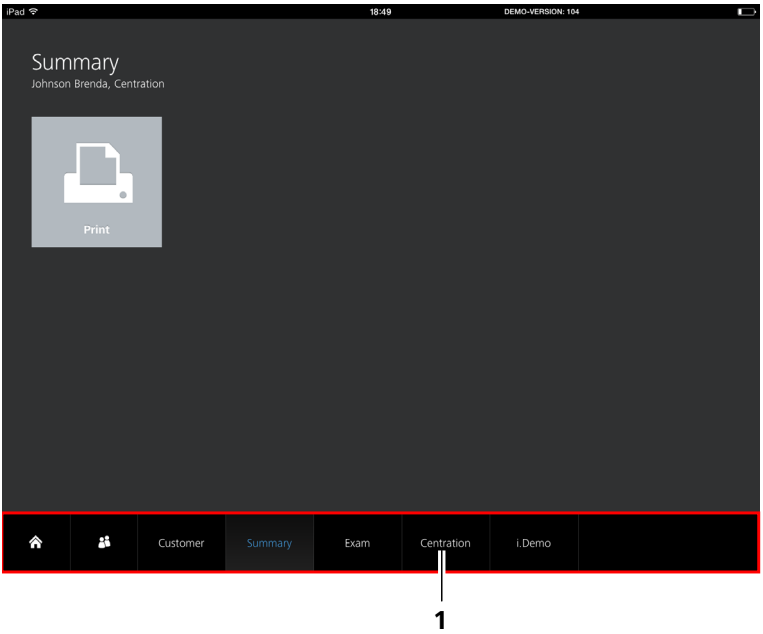


1 **New consultation** tile

Fig. 4: **Customer** module

- Touch **New consultation** (**1**, Fig. 4) to determine a new container for storage of the data of the current consultation of the customer.
- Enter a name for this consultation in the **New consultation** dialog which appears next, and acknowledge the entry by pressing **Done**.

The Summary module appears (see Fig. 5).

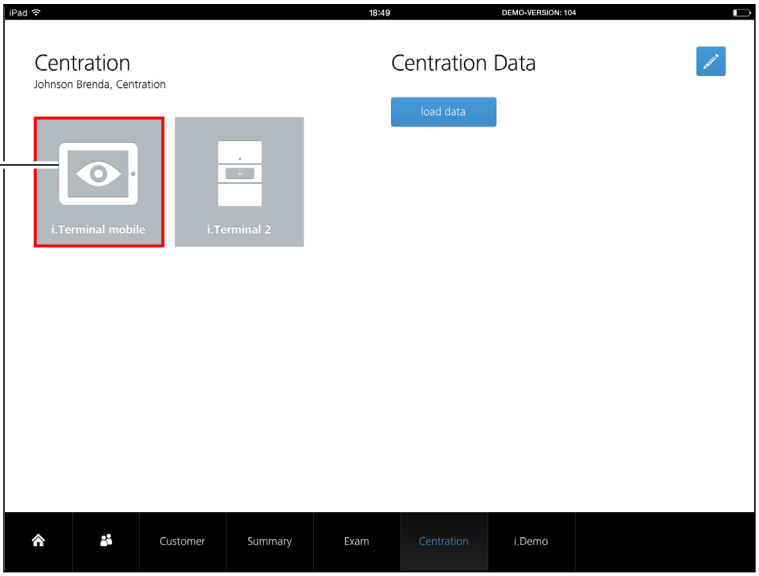


1 **Centration** button in the menu bar

Fig. 5: **Summary** module

- Touch **Centration** (**1**, Fig. 5) in the menu bar.

The Centration module appears (see Fig. 6).



1 **i.Terminal mobile** tile

Fig. 6: **Centration** module

Now you can touch the **i.Terminal mobile** tile (**1**, Fig. 6) to start image capture to determine the centration data.

- The application of i.Terminal mobile to determine the centration data in conjunction with the calibration tool is described in section *Operation* as of page 17.

Operation

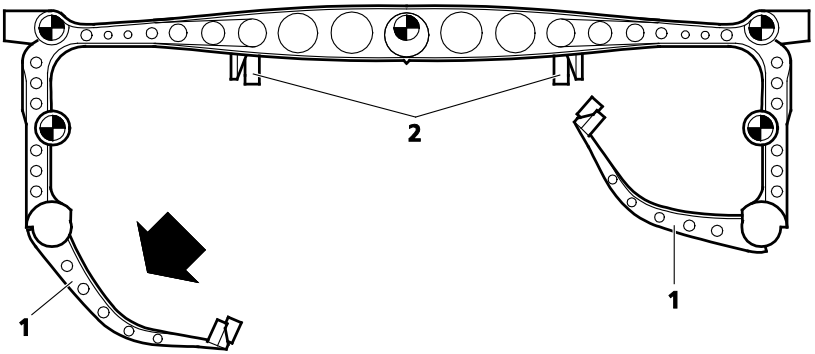
☞ A compact description of operation of the software application i.Terminal mobile is provided in the Quick Guide i.Terminal mobile included in the scope of supplies.

Use of the calibration tool

- Remove any supporting shims from the frame to avoid annoying reflections.
- To obtain an optimum result, fit the customer with the selected frame in an anatomically correct and complete fashion.
  The fit of the frame on nose and ears and the horizontal alignment are especially important.

☞ If the adjusted frame is modified subsequently, the centration data must be determined anew.

- Open the clips (**1**, Fig. 7) by pulling them outwards until they lock in.



1 Clips
2 Groove edge

Fig. 7: Open the locating grooves of the calibration tool.

☞ When the calibration tool is not in use, keep it in its storage box.

- Take the calibration tool in one hand and place the frame onto the upper groove edge using the other hand (see **2**, Fig. 7).

- Hold the calibration tool and the frame firmly with one hand and close the clips one by one with the other hand (see Fig. 8).

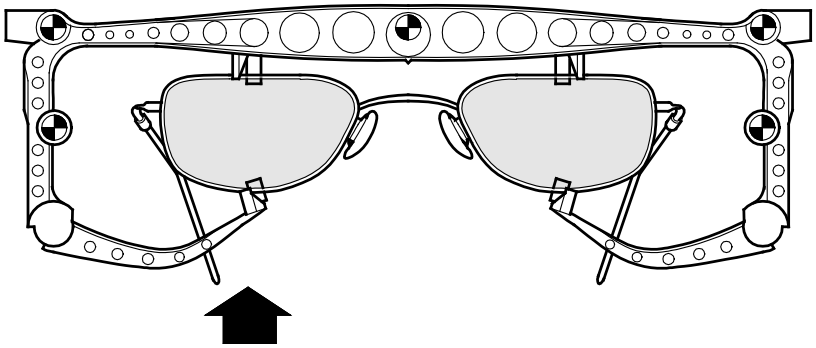


Fig. 8: Calibration tool with frame

- Make sure the calibration tool is positioned centrally on the frame.

Positioning the customer for image capture

- Ask the customer to put on his/her selected frame together with the centered calibration tool such as he/she would do so later.
- Demonstrate to the customer how to adopt a natural, relaxed position for image capture by means of the i.Terminal mobile.

Image capture

Taking the front image

- Position yourself with the iPad at a distance of approx. 40 to 50 cm in front of the customer. It is recommended to make the measurement while standing.
- Make sure to tilt the iPad as little as possible.
- While in the iPad **Centration** module, touch the **i.Terminal mobile** tile to change over to image capture of i.Terminal mobile.
- Ask the customer to remain as immobile as possible in his/her position, to look into the camera (colored mark) on the iPad and not to blink.
- Hold the iPad so that the camera is on top left, when viewed by the customer.
- Hold the iPad in vertical position, keeping it as immobile as possible. If the customer turns his/her head in an unnatural fashion, reposition him/her anew.

The live image and the contour of a head with glasses on it appears on the iPad.

- Select the distance so that the contour includes the customer's head.

The contour of the frame is to enclose the glasses as well.

☞ As soon as the contour in the live image changes to green and the customer's face coincides with the contour, the photo can be taken.

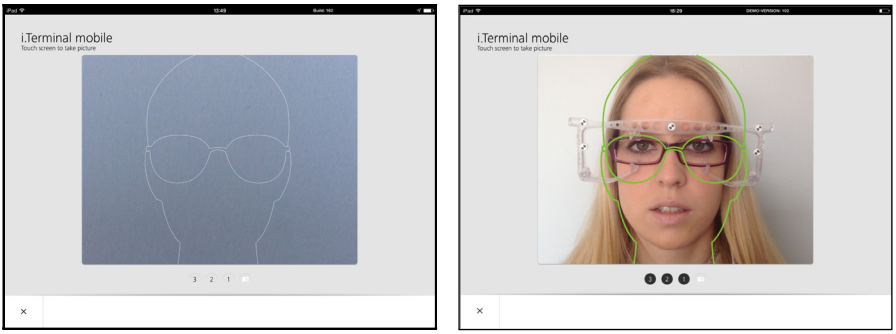


Image capture mode started

Image capture in process

Fig. 9: Image capture mode

- Touch on the screen of the iPad to start image capture.

A countdown starts at the end of which a photo or a series of photos is taken automatically.

This takes a few seconds. The process can be observed via the status symbols . Once all symbols are black, recording is complete and the photos can be regarded successively on the iPad.

The countdown can be selected within a range of 1 to 5 seconds, the number of photos taken in the range from 1 to 5 photos, see the i.Com mobile **Settings** menu.

The values 3 seconds and 3 photos are recommended.

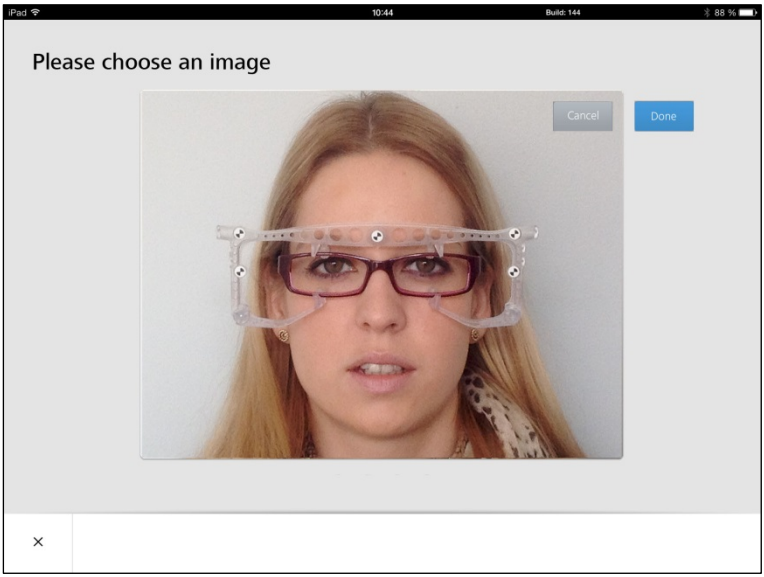


Fig. 10: Photo selection

- Swipe to select the best of the photos taken and touch **Done**.
- To measure the additional parameters back vertex distance and mounting lens angle, touch optionally **Side image** (see section *Taking side image* on page 23).
- If you do not want to perform this measurement on the side image, touch **Done**.

Now, i.Terminal mobile prepares the selected photo for determination of the centration data and changes over to centration data determination mode (see section *Determining the centration data* on page 26).

☞ Touch **Cancel** to discard the photos and return to image capture mode.

Taking side image

- Ask the customer to turn by 90° so that the calibration tool is visible.

☞ As soon as the contour in the live image turns green, a photo can be taken.

- Touch the screen to record the side image.
  Once recording has been triggered, a photo is taken automatically.

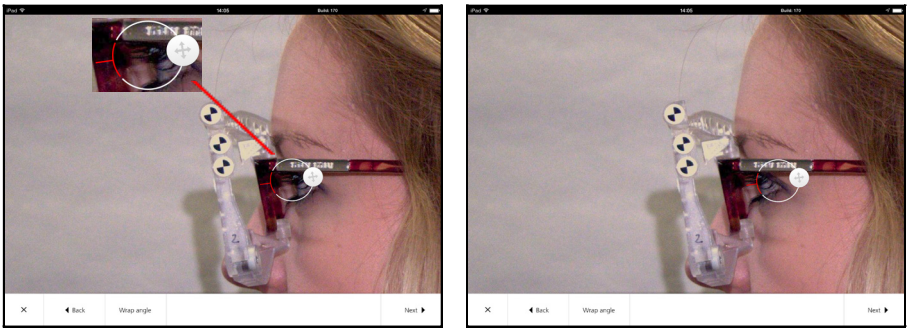
Fig. 11: Capturing side image

- Check that the photo is OK. Otherwise, take a new photo.
- Touch **Done** to measure the back vertex distance and the mounting lens angle, see section *Measuring back vertex distance and mounting lens angle* on page 24.

☞ Touch **Cancel** to discard the photo and return to the image capture mode.

Measuring back vertex distance and mounting lens angle

- Position the red mark on the front of the cornea using the handle.
- Should this not be possible due to an excessively broad side piece, measure the back vertex distance manually.

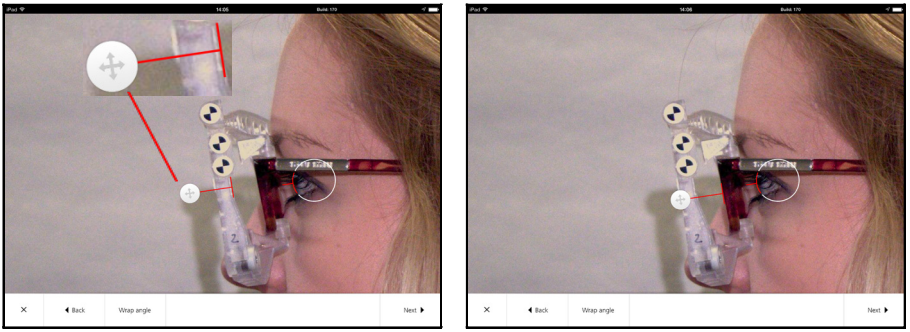


Measuring back vertex distance | Measuring mark positioned

Fig. 12: Measuring back vertex distance

- To measure the mounting lens angle, touch **Wrap angle**.

- Position the red measuring mark on the front side of the outer rim of the frame.



Measuring mounting lens angle

Measuring mark positioned

Fig. 13: Measuring mounting lens angle

- Touch Next ▶ to continue (see section *Determining the centration data* on page 26).

Determining the centration data

Determination of the centration point position

After change-over to centration data acquisition mode, the photo taken is opened (see Fig. 14).

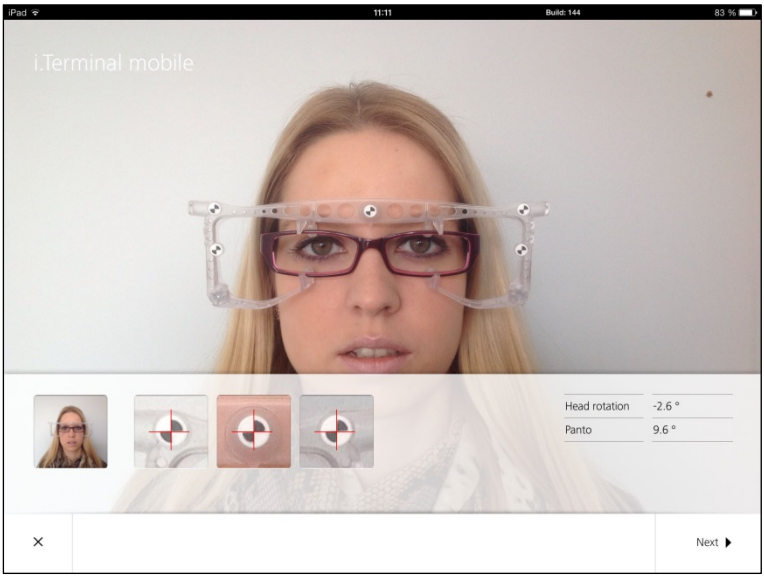


Fig. 14: Start screen in centration data acquisition mode

- Check that the markers of the calibration tool have been detected correctly.

Three front markers detected correctly!

☞ Use only plausible and complete centration data and the data derived from these. It may be necessary to repeat image capture.

Check on a regular basis that the black-and-white measuring markers of the calibration tool are still focused and clearly visible. Do not try to retrace them using a felt-tip pen, as this might impair their functionality. Depending on the intensity of use, regular replacement at intervals of 6 to 24 months may be necessary to ensure safe and smooth operation.

If the functionality of the calibration tool is no longer ensured, we recommend ordering a replacement calibration tool from the Carl Zeiss Vision GmbH distributor in your area immediately.

- Touch Next ▶ to commence determining the centration data.

☞ If you want to cancel determination of the centration data, touch **X**. You can discard the photo in the following dialog via **Exit without saving** or save it for subsequent processing via **Save new measurement**. In this case, the photo is assigned to the current consultation.

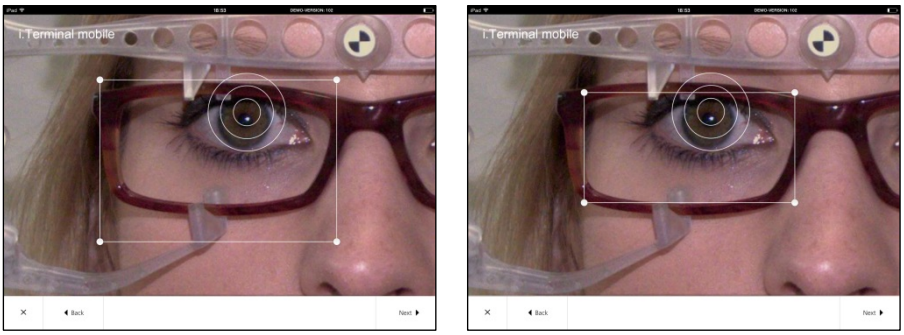
The **Adjust BVD** dialog appears (Fig. 15).

Fig. 15: **Adjust BVD** dialog

- Specify the manually measured back vertex distance (BVD) or accept a suggested value. Acknowledge by touching **Apply**.

In the following views, you can determine the centration data.

☞ Centration starts with the right eye.

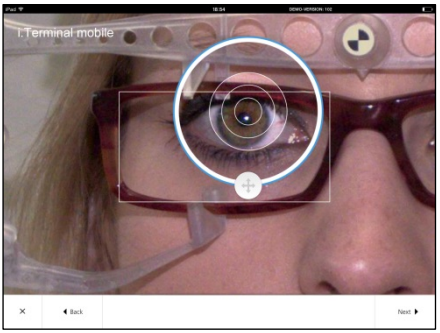


Adjusting auxiliary frame for frame

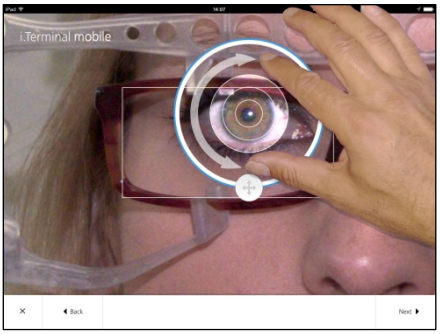
Auxiliary frame adjusted

Fig. 16: Adjusting the auxiliary frame for the frame

- Adjust the auxiliary frame for the frame via the handles (Fig. 16) so that all four lines are in contact with the inner edge of the frame.
- Touch Next ▶.



Adjusting right-hand centration point position



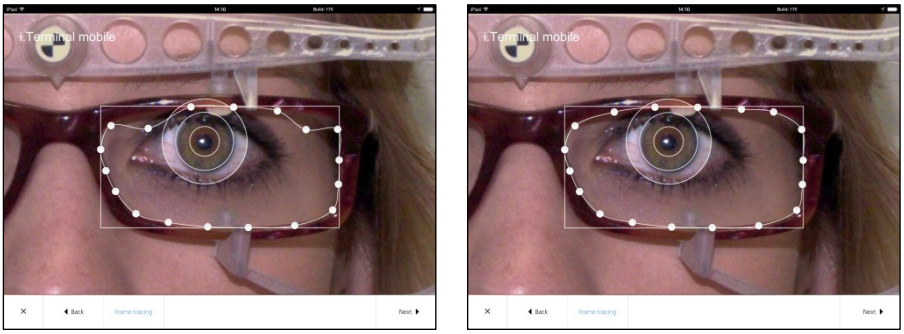
Right-hand centration point position adjusted, contrast feature activated

Fig. 17: Adjusting the centration point position

- Move the handle to adjust the measuring outline (Fig. 17) so that the circles are concentric to the pupil center (centration point).

☞ To facilitate detection of the pupil during centration, you can use the contrast feature of i.Terminal mobile as required (see Fig. 17, right-hand side).

- Touch Next ▶.
- Repeat positioning of the auxiliary frames and the pupil center for the left-hand side.
- You can detect the shape of the lens at choice on the left or right side. To this effect, touch Frame tracing.



Detecting lens shape

Lens shape detected

Fig. 18: Detecting the lens shape

- Use the handle to adjust the form element to the inner contour of the lens shape (Fig. 18).

Determination of the lens shape is useful in case lenses with optimized thickness are to be ordered (e. g. Optima).

- Touch Next ▶.

The **Auto-y** dialog appears.

Fig. 19: **Auto-y** dialog

- Transfer the value measured for the pantoscopic angle or correct the latter manually and acknowledge at the appropriate option by **Apply** (Fig. 19).

☞ The **Auto-y** dialog is only visible if the function Auto-y is activated.

In the next view (Fig. 20), you can determine the lens and frame type.

Selection of the lens type, the frame type and activation of the autocorrect feature (Auto Correction)

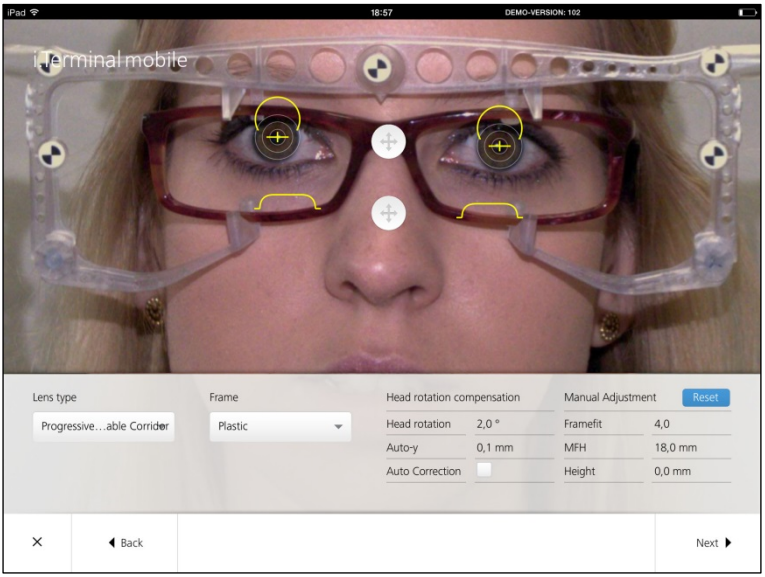
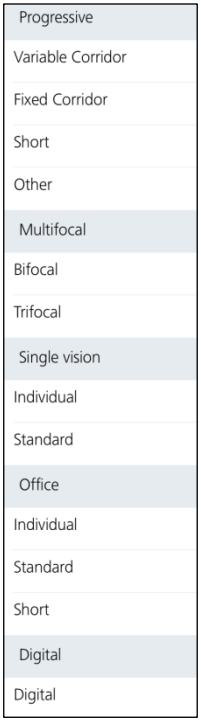


Fig. 20: Select the lens type, the frame and activate the autocorrect feature (Auto Correction).

- Select in the dropdown lists **Lens type** or **Frame** the type of lens or frame (Fig. 20 or Fig. 21).



Selecting lens type

Selecting frame type

Fig. 21: Dropdown lists **Lens type** or **Frame type**

Depending on the choice, a suggestion for the recommended centration data is calculated and displayed.

- Using the handles displayed , correct, if necessary, the setting for the fitting height (y) and the progression length (frame fit) (Fig. 20).
- Compensate the head rotations using the Autocorrect feature (**Auto Correction**) (Fig. 20). To this effect, tick off Auto Correction .

☞ If compensation of the head rotation is activated, the centration cross-hair marks do not coincide with the pupil centers due to the compensation of head rotations.

- Touch Next ▶.

In the next view (Fig. 22), you can determine shape and size of the raw glass.

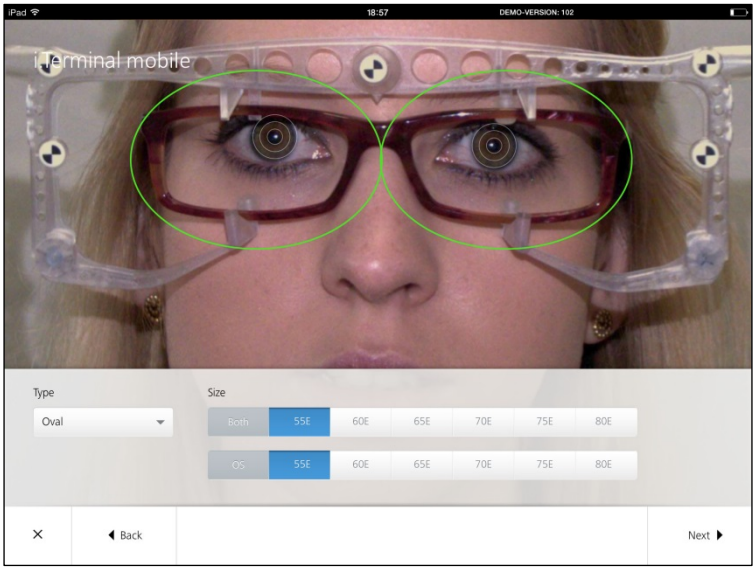


Fig. 22: Selection of shape and size of the raw glass

- Select the raw glass shape via the dropdown list **Type** (Fig. 22).
- Select the size of the raw glass via the Table **Size** (Fig. 22).

Select shape of raw glass

☞ Identical or different sizes can be selected for the raw glasses of the two sides. The selected size is symbolized in the front image by green rings.

- Touch Next ▶.

The final screen shows all the measured and determined data as result (Fig. 23).

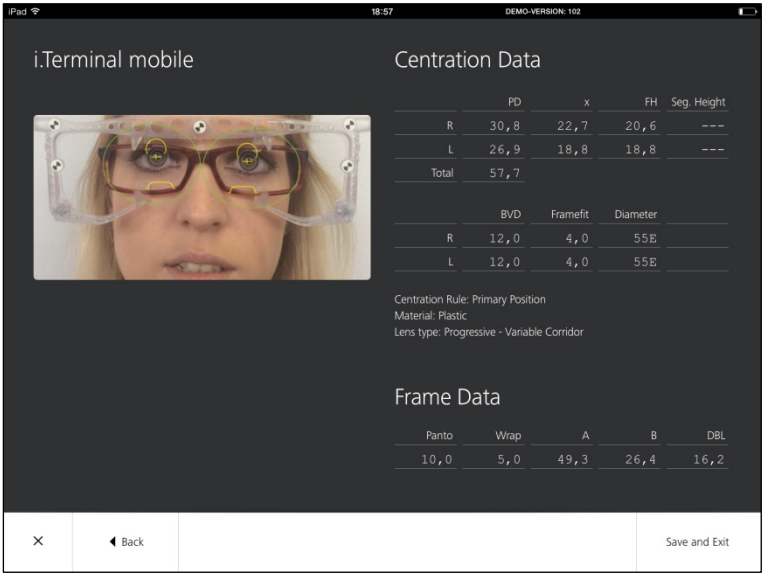


Fig. 23: Centration data and frame data

☞ Touch ◀ Back, in order to perform any necessary corrections.

- Touch **Save and Exit**, in order to save the centering data and the image in i.Com mobile for the current consultation.

The data is saved and i.Com mobile returns to the **Centration** module (Fig. 24). Centration is thus complete.

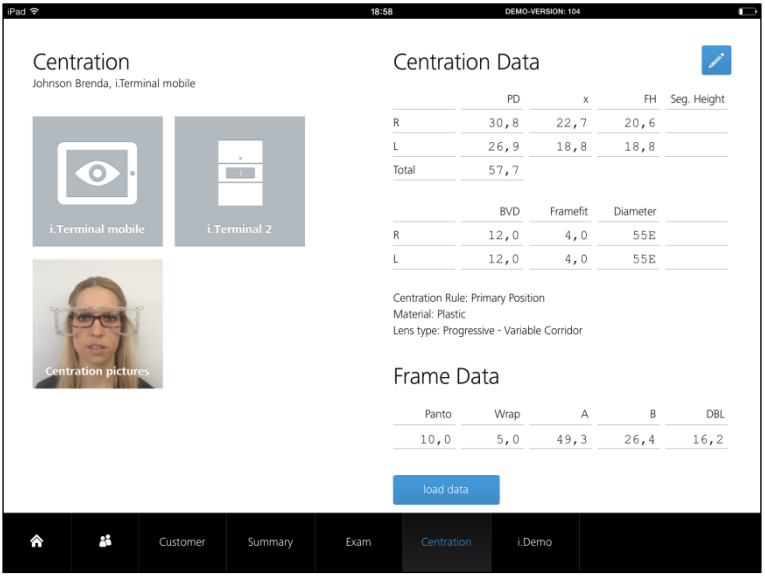


Fig. 24: **Centration** module an overview of the centration and frame data

Touch the **Centration pictures** tile to re-start centration of the picture taken previously.

For all subsequent steps and supplementary explanations, please refer to the Quick Guide i.Com mobile.

Specific settings for i.Terminal mobile

In the **Settings** menu of i.Com mobile, certain parameters can be adapted for application of i.Terminal mobile.

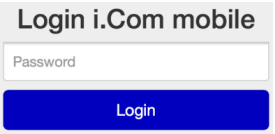
- In the main menu of i.Com mobile, touch the **Settings** tile (**1**, Fig. 25) to open the **Settings** menu.

1 **Settings** tile

Fig. 25: i.Com mobile main menu

The **Settings** menu is password-protected.

- Enter the factory-set password
  !Admin?12
  or the currently assigned password and touch **Login**.



The **Settings** menu opens (Fig. 26).

☞ To change the password, use the setting option **Server**.

Setting option Centration

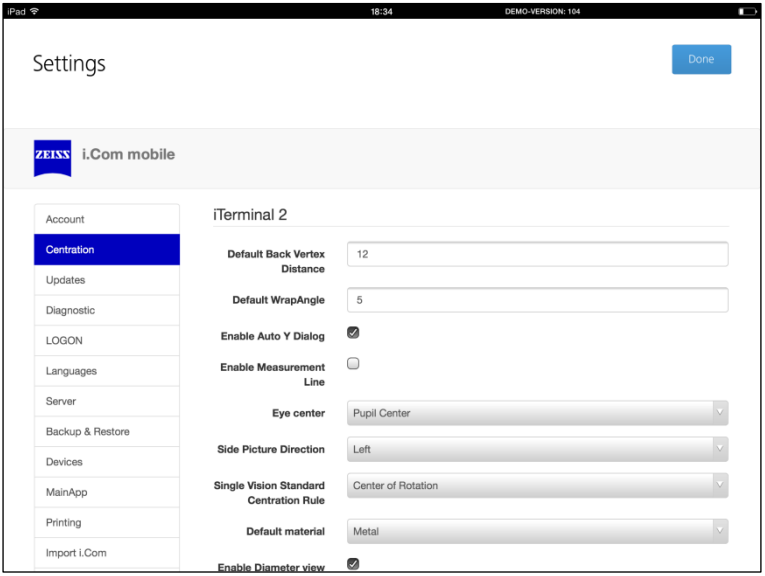


Fig. 26: **Settings** menu, setting option **Centration**

- Touch the setting option **Centration** and scroll into the lower part of the dialog.

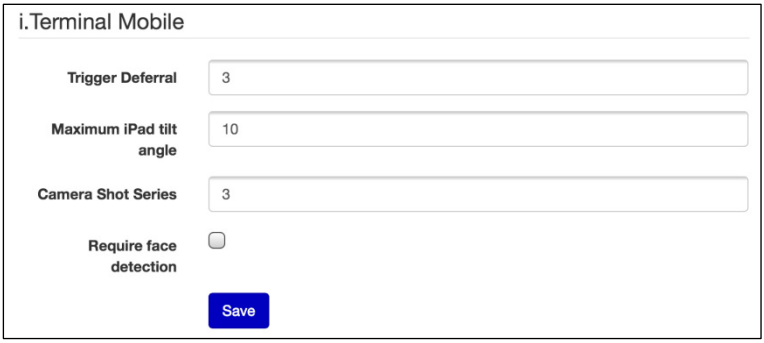


Fig. 27: Settings for i.Terminal mobile, Centration

- If necessary, change the settings for i.Terminal mobile regarding:
  - the **Trigger Deferral** in the range from 1 to 5 seconds,
  - the **Maximum iPad tilt angle**,
  - the **Camera Shot Series** in the range from 1 to 5.
- Activate or deactivate the setting **Require face detection**, to use or not to use this function for image capture.
- Touch **Save**, in order to transfer the new settings, and **Done**, in order to exit the **Settings** menu.

Setting option Features

- Touch the setting option **Features**.

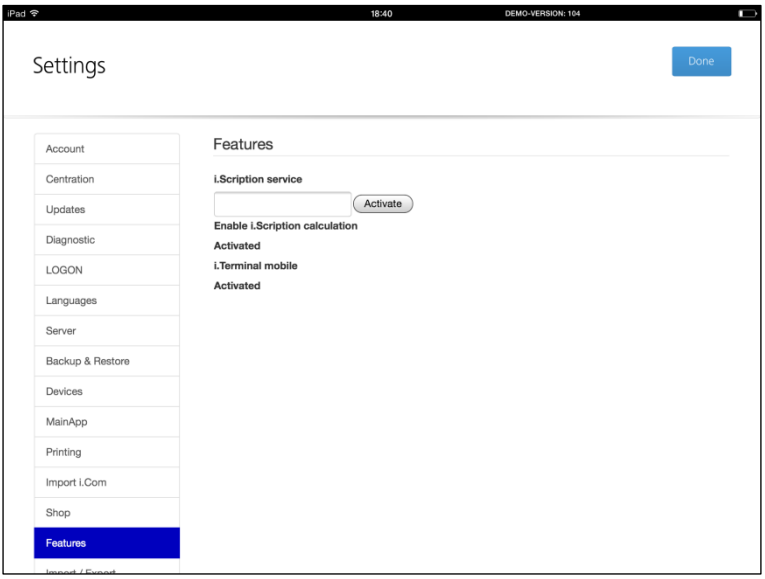


Fig. 28: Setting option **Features**

- **i.Scription service**: Activate by entering the license number and by acknowledging via the **Activate** button.
- **Enable i.Scription calculation**: Status **Activated**.
- **i.Terminal mobile**: Activate by entering the license number and by acknowledging via the **Activate** button.

How to put the unit out of operation

Exiting i.Terminal mobile

The software application i.Terminal mobile need not be exited separately. It is closed together with the application i.Com mobile.

- Close i.Com mobile on the iPad (see Quick Guide i.Com mobile).
- If applicable, switch the i.Com mobile box OFF (see Quick Guide i.Com mobile).

Maintenance and service

Performing software updates

If software updates are available, these are displayed in the Start screen of i.Com mobile in the inbox.

The update can be started directly from the inbox.

Service contact details

In case of problems regarding i.Terminal mobile, please contact your national Carl Zeiss Vision distributor.

For the contact data, please refer to the enclosed Service Contact List (20_070_7217I).

General Licensing Agreement for i.Terminal mobile software

General Licensing Agreement for Software Products of
Carl Zeiss Vision GmbH, Turnstrasse 27, D-73430 Aalen

i.Terminal mobile minimum system requirements:

- iPad with IOS 7 and Retina Display.
- Internal WiFi with Internet connection for updates and connection to ZEISS systems.
- i.Com mobile server incl. software.

1. Area of application

This licensing agreement shall be valid for the use of the i.Terminal mobile software. We explicitly reserve the right to make changes and additions. Conflicting license agreements shall not be part of this agreement. Furthermore, our General Terms & Conditions in their respective currently valid versions shall apply.

2. Licensed item

2.1. The licensed item is the i.Terminal mobile standard software together with its updates (hereinafter referred to as "software"), which our customers may download from our website.

2.2. The licensee shall ensure that his/her iPad meets the minimum technical requirements for installation of the i.Terminal mobile software, as well as associated updates.

2.3. We emphasize that it is not possible to write software that always works flawlessly in all applications and combinations. Therefore, this license applies to software which can generally be used error-free as defined by the software description.

3. Copyright

3.1. This software is subject to copyright law. The customer acknowledges that he/she has no rights in relation to the software over and above those set out in this licensing agreement, rather, that these rights remain assigned to the licensor and/or the respective owner. There is no entitlement to the source code.

3.2. As necessary, certain services and representations of the software may be carried out with the assistance of third-party services. We shall not be responsible for the contents and performance of third parties. If third party services are used, their General Terms and Conditions shall apply respectively.

4. Rights of use

4.1. Within the scope of these conditions, the customer shall be granted non-exclusive, personal usage rights (license) to the respectively purchased software in the as-ordered version. The customer shall be obligated to use the software for his own purposes only.

4.2. The customer shall be allowed to copy the software only insofar as is required for the contractual application of the software. The customer shall therefore be allowed to install the software for use.

4.3. The customer shall not be permitted to copy the software fully or in part. The customer may not commercially redistribute or sub-license the software fully or in part.

4.4. The customer shall not amend, delete or make otherwise unrecognizable copyright annotations, trademarks and other legal reservations, serial numbers and other features.

4.5. The customer shall not change the software. Decompilation of the software is only permitted in accordance with the legal restrictions of 69e of the German Copyright Act. Further decompilation shall not be permitted.

4.6. The customer shall not be permitted to transfer or give the software to a third party. Moreover, the customer shall not disclose to any other party passwords or login information for the software or databases associated with this software. If third parties are interested in the software, they may contact the licensor directly.

5. Right to terminate the license

Both parties shall be entitled to terminate this license for cause. An important cause exists for the licensor if the customer violates the terms of use as per section 4 of this licensing agreement and continues this behavior even after receiving written warning about termination from the licensor. In the event of termination, the customer shall delete or destroy all data carriers, including all copies of the software. Upon the licensor's request, the customer shall send the licensor written confirmation of the full deletion or obliteration.

6. Liability for material defects

The following shall apply in addition to section 9 of our General Terms & Conditions of Sale:

6.1. Because the customer acquires the software via the Internet, the licensor does not guarantee that the software is free from defects or computer viruses.

6.2. Provided that the software is used as intended, the licensor guarantees that the software shall work as described in the product description. This warranty does not cover defects resulting from changing, damaging, improperly or inappropriately using the software or using it in any way other than the intended use as defined in this licensing agreement. Improper use exists, in particular, if the customer deviates from the described installation process.

6.3. In the event of a warranty or liability claim against the licensor, contributory negligence of the licensee must be taken into consideration if the customer has failed to take precautions through appropriate security measures against external influences, particularly computer viruses or other phenomena, which might jeopardize data or an entire database.

7. General Terms and Conditions of Sale

Furthermore, our General Terms & Conditions of Sale are applicable in their respective currently valid versions. In the event of a contradiction, the terms & conditions of this licensing agreement shall take precedence.

8. Final Provisions

8.1. The contract shall be subject to the law of the Federal Republic of Germany exclusively.

8.2. Place of jurisdiction shall be the registered offices of the licensor.

8.3. If the customer is a merchant, a legal person under public law or a special fund under public law, the exclusive place of jurisdiction for all claims arising from this contractual relationship shall be the regional court at the licensor's legal domicile.

Abbreviations

BVD	Back vertex distance
EEC	European Economic Community
EU	European Union
IEC	International Electrotechnical Commission
ISO	International Standardization Organization
MPG	German Medical Products Act
WiFi	Wireless Fidelity
WLAN	Wireless Local Area Network (local radio network)

Glossary

☞ For further information concerning measuring processes and the following topics, please refer to the online compendium under:

http://www.zeiss.de/kompendium.

Centration data summary

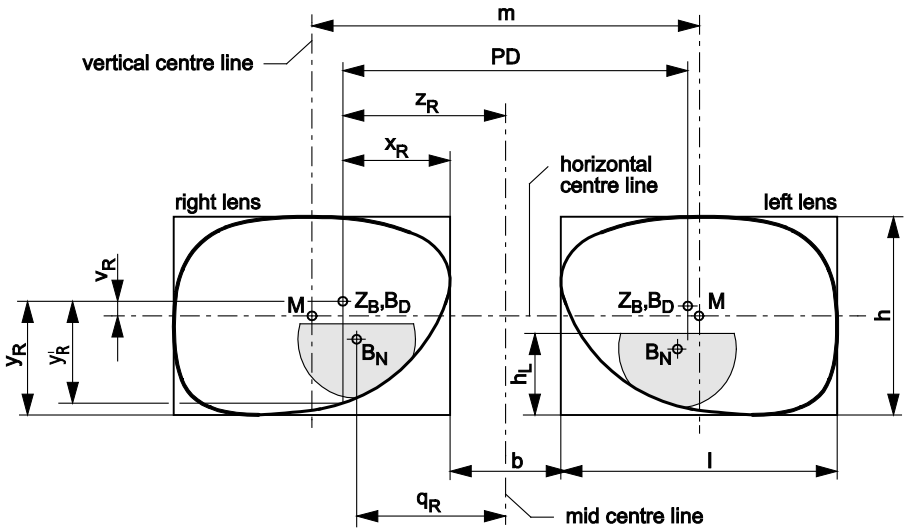


Fig. 29: Sizes and designations regarding lenses and frames

PD Pupillary distance

M Geometrical center of the lens shape

m Center-to-center distance of frame

Z_B Centration point

B_D Distant reference point

B_N Near reference point

x Horizontal component of distant reference point measured from the nasal box edge

y Vertical component of near reference point measured from the lower box edge

y´ Vertical component of the distance reference point measured to the bevel apex directly below Z_B.

z Centration point distance. In non-prismatic lenses, this corresponds to the "single PD" relative to the frame center.

In bifocal and multifocal lenses, additional centration data are calculated for the near portion:

q Horizontal distance between near portion center and box edge

h Height of near portion from lower box edge

☞ For further details concerning centration, see standard ISO 21987.

Correction of head rotation (Auto Correction)

The **Correction of head rotation** function depicts a horizontal rotation of the head that is taken into account during measurement, and subsequent correction of that measurement. This function is used to correct the measured horizontal centration data (PD and x) by the amount of head rotation. The absolute distance between the centration points (total PD) remains unchanged. What does change, however, is each of the monocular PD values, by the amount of **correction of head rotation** (parallel displacement).

The evaluation program calculates the horizontal positions of the centration points as if the customer had held his/her head straight while the photo was being taken. The extent of correction depends on the degree of head rotation and the back vertex distance.
The result per degree of head rotation is a value of approx. ±0.5 mm for each side.

The purpose of the **Correction of head rotation** function is not to make the centration data (PD and x) symmetrical but, rather, to eliminate the portion which is caused by head rotation and which is not habitual.

The **Correction of head rotation** function may be enabled or disabled for each measurement. The correction value will be displayed. In this case, the centration points will also be displaced horizontally by the correction value relative to the pupil center.

When should the Correction of head rotation function be used?

The **Correction of head rotation** function is recommended where an individual assumes a very "unstable" posture during image capture, i.e. their posture does not appear to be reproducible. In particular where there is significant head rotation we recommend that a second photo be taken. If the head rotation is reproduced the second time, the value should not be corrected. Check in such cases if the head rotation is habitual. If the measured head rotation is now significantly different, we recommend using the **Correction of head rotation** function.

The calibration tool should be centered on top of the frame to allow precise calculation of the corrections due to head rotation.

Natural posture

Natural posture is the posture adopted by an individual in a standing or sitting position for a defined visual task (facing straight ahead). This posture is subject to certain natural variations; in other words, each individual in this situation will have not just one natural posture, but a whole range of natural postures. This range is specific to each individual (depending on body height, etc.).

Strictly speaking, a large number of measurements would have to be taken for each individual to determine the centration data on the basis of the average value. For obvious reasons, this method cannot be used to measure centration data. Therefore, we use a single random sample to determine the centration data.

Since the natural posture of most individuals varies within relatively confined limits (pantoscopic angle of ±2°), even a single measurement is sufficient to fit the glasses. Vertical differences of 1–1.5 mm occurring in multiple measurements can be considered normal and non-critical. Serial measurements have also shown that measurements in a standing position tend to produce smaller vertical variations.

The vertical correction function is also available (see section *Vertical correction (auto-y)* overlead).

Vertical correction (auto-y)

The **auto-y** function makes it possible to measure the current pantoscopic angle and then to convert the vertical centration data to a different, freely selectable pantoscopic angle, taking into account the specific situation.
(Note: for progressive lenses the recommended pantoscopic angle is 7°-11°. An angle of 9° is specified as the ideal angle.)

Using the **auto-y** function reduces the variation of the vertical centration values (y values), without the need for additional measurements.

When should the auto-y function be used?

For a number of individuals, significantly greater variations in posture were observed during multiple measurements. This is usually due to the fact that these individuals, unintentionally, do not find their normal, relaxed posture in the measurement situation. Variations in the pantoscopic angle of ±5° are not uncommon for such individuals.

If, despite several attempts, an individual is unable to adopt a "natural posture" in the measurement situation, it is useful to convert the measured value to a defined pantoscopic angle.

One example in this context is individuals who markedly raise their heads during measurement when looking at the fixation target. (This behavior is typical of previously under-corrected progressive lens wearers.) In such a case, it is advisable to convert the measured pantoscopic angle (which is often very small or even negative) to an empirical "normal" value.

A general conversion of y values to the default value of 9° is not recommended in our view.

Calculation of centration data for bifocal and multifocal lenses (drop angle)

i.Terminal mobile offers a special feature for the centration of bifocal and multifocal lenses: the drop angle (β). This angle defines the amount by which the patient has to lower his/her eyes from the zero visual direction to reach the segment top.

We recommend centration for bifocal and multifocal lenses based on the drop angle. If desired, the drop angle (β) can be adjusted using the up/down arrow keys.
Only the drop angle makes allowance for the patient's specific back vertex distance.

Experience has shown that glasses with bifocal lenses with a β-value of approx. 14° generally provide a high level of visual comfort. Naturally, modifications of this value may be required to meet the patient's specific needs.

The drop angle is particularly important when the wearer needs new glasses. The vertical measurements of the near portions in the old glasses may only be used for the new glasses if the back vertex distance and pantoscopic angle are unchanged. If this is not the case, retaining the previous vertical measurements would cause a change in visual habits. With the i.Terminal mobile, the required drop angle can be set in each case and the centration data can be calculated on this basis.

As in single-vision lenses, the recommended centration in multifocal lenses can also be vertically adjusted using the up/down arrow keys. The pop-up window displays the respective vertical centration of the distance reference point (y), showing the difference from the measured value.

For bifocal and multifocal lenses, the software also displays the vertical measurements for the near portion, measured from the lower box edge (h), and the drop angle.

Illustrations

Fig. 1: **i.Com mobile**, **i.Profiler mobile** and **i.Terminal 2** icons on the iPad 11
Fig. 2: i.Com mobile main menu 12
Fig. 3: **Customer** menu 13
Fig. 4: **Customer** module 14
Fig. 5: **Summary** module 15
Fig. 6: **Centration** module 16
Fig. 7: Open the locating grooves of the calibration tool. 18
Fig. 8: Calibration tool with frame 19
Fig. 9: Image capture mode 21
Fig. 10: Photo selection 22
Fig. 11: Capturing side image 23
Fig. 12: Measuring back vertex distance 24
Fig. 13: Measuring mounting lens angle 25
Fig. 14: Start screen in centration data acquisition mode 26
Fig. 15: **Adjust BVD** dialog 28
Fig. 16: Adjusting the auxiliary frame for the frame 28
Fig. 17: Adjusting the centration point position 29
Fig. 18: Detecting the lens shape 30
Fig. 19: **Auto-y** dialog 30
Fig. 20: Select the lens type, the frame and activate the autocorrect feature (Auto Correction) 31
Fig. 21: Dropdown lists **Lens type** or **Frame type** 32
Fig. 22: Selection of shape and size of the raw glass 33
Fig. 23: Centration data and frame data 34

Fig. 24: **Centration** module an overview of the centration and frame data 35
Fig. 25: i.Com mobile main menu..... 36
Fig. 26: **Settings** menu, setting option **Centration**..... 37
Fig. 27: Settings for i.Terminal mobile, Centration 38
Fig. 28: Setting option **Features**..... 39
Fig. 29: Sizes and designations regarding lenses and frames..... 47

Index

A

Abbreviations....46
Auto Correction....31, 32, 48
Auto-y....30, 51

B

Back vertex distance....28
BVD....27

C

Calibration tool....17
Centration data....26, 34, 47, 52
Commissioning....10
Consultation....14
Correction of head rotation....48

D

Directive....9
Drop angle....52

E

Exiting i.Terminal mobile....40

F

Frame....29, 30
Frame data....34
Frame type....31

G

Glossary....47

H

Head rotation 48
How to put the unit out of operation 40

I

Illustrations 53
Image capture 19, 20
Index 55
Installing the software application i.Com mobile 10
Intended use 9

L

Lens type 31
Licensing agreement 42

M

Main menu i.Com mobile 12
Maintenance 41
Measuring procedure 52
Medical devices 9
Menu Customer 13
Module Centration 16
Module Customer 14
Module Summary 15

N

Natural posture 50

O

Operation 17

P

Pantoscopic angle 31, 51

Position of centration point....26
Positioning the customer....19
Prerequisites....10
Provisions for use....9

R

Regulations....9

S

Safe functioning....6
Safety instructions....5
Scope of supplies....8
Service....41
Service contact details....41
Settings....36
Software update....41
Spare parts....8
Standards....9, 10
Start i.Terminal mobile....12
Symbols....5

U

Update....41

V

Vertical correction....51

Carl Zeiss Vision GmbH
Turnstrasse 27
D-73430 Aalen
Germany

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